

REMARKS

The above amendments are made without prejudice. Reconsideration is respectfully requested.

Claims 1-12, 14, 16, 18, 20, and 23-29 have been canceled.

New claims 30-39 have been added.

Claim 13 recites that nitriding or carbonitriding treatment including cycles in which the pressure of a controlled nitrogen or carbon and nitrogen atmosphere increases and decreases in a pulsed manner. Claim 30 also includes this recitation. This method step cannot be found in any of the documents cited by the Examiner, and consequently, the amended independent claim 13 and new claim 30 are considered to be novel. Furthermore, as described in the final paragraph of page 7 of the specification, "This measure facilitates penetration of the gas into the pipe bore, despite its small diameter, and helps in the treatment of the internal surface of said pipe".

Notably, U.S. Patent No. 4,458,724 to Kubo acknowledges the difficulty of uniformly filling a tube of small diameter with gas over its entire length. See column 1, lines 30 and 35. Kubo proposes the formation of a diffusion layer, comprising a solid solution of nitrogen, by a "Tufftriding" treatment in which the tubes are axially vibrated in a bath of molten sodium cyanide before heat treatment in nitrogen, etc. See Column 2, lines 4 to 9.

Nowhere does the Kubo reference teach the claimed step: "wherein said nitriding or carbonitriding treatment includes cycles in which the pressure of a controlled nitrogen or carbon and nitrogen atmosphere increases and decreases in a pulsed manner". Kubo proposes a method which requires an additional process prior to heat treatment, and uses a process which is not environmentally friendly (since it requires molten cyanides). In addition, it appears that the disclosed method would be limited to straight tubes, because axial vibration during "Tufftriding"

is required. Moreover, the pending claims recite a step not disclosed or contemplated by the Kubo disclosure.

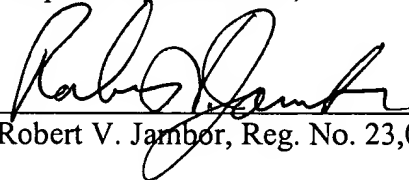
Japanese Patent No. JP 11 166 6773 to Yoshinori was relied on by the Examiner. A computer generated translation is submitted herewith. This reference discloses gas nitriding of the inner surface of a tube. See paragraph 0006 of the translated document. The nitriding process in one embodiment comprises heating the tube while circulating ammonia gas through it. See paragraphs 0011 and 0021. In order to produce the flow of ammonia, a conduit is connected to the ends of the tube. See paragraph 0011. However, Yoshinori provides no suggestion of nitriding or carbonitriding in which the pressure of the controlled atmosphere is increased and decreased in a pulsed manner as required by the present independent claims.

Since the presently claimed invention is advantageous, and is not suggested by the prior art, it is considered to be inventive and pending claims allowable.

Any required fees may be charged to Deposit Account No. 10-0460.

Favorable reconsideration is requested.

Respectfully submitted,



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